What is claimed is:

1. A semiconductor manufacturing apparatus, composed of a vacuum vessel; wherein,

at least one substrate stage is provided on said vacuum vessel bottom plate;

a cylinder is installed surrounding said substrate stage;

the gap between said cylinder and said vacuum vessel top plate or bottom plate is made variable by lifting/lowering said cylinder;

at least one cylinder lifting/lowering mechanism per one said cylinder is provided, in order to separate a space inside said cylinder composing a processing chamber for processing said substrate surface from a space outside said cylinder composing a transport chamber for transferring said substrate;

said transport chamber is provided with a substrate conveyer mechanism for transferring said substrate between said processing chamber and said transport chamber through said gap;

said processing chamber is provided with a processing chamber gas inlet and a processing chamber gas outlet; and

said transport chamber is provided with a transport chamber gas inlet and a transport chamber gas outlet.

2. A semiconductor manufacturing apparatus, composed of a vacuum vessel; wherein,

a plurality of substrate stages are provided on said

vacuum vessel bottom plate;

cylinders provided respectively with an O ring are connected to said bottom plate through a bellows so as to surround said substrate stage;

the gap between said cylinder and said vacuum vessel top plate is made variable by lifting/lowering said cylinder, and at a position where said gap becomes minimum, a plurality of cylinder lifting/lowering mechanisms per one said cylinder are provided, in order to separate hermetically a space inside said cylinder for composing a processing chamber for processing said substrate surface with said O ring from a space outside said cylinder for composing a transport chamber for transferring said substrate;

said transport chamber is provided with a substrate conveyer mechanism for transferring said substrate between said processing chamber and said transport chamber through said gap;

said processing chamber is provided with a processing chamber gas inlet and a processing chamber gas outlet; and

said transport chamber is provided with a transport chamber gas inlet and a transport chamber gas outlet.

3. The semiconductor manufacturing apparatus according to claim 1 or 2, wherein said vacuum vessel can be divided into a part including said processing chamber and a part having said substrate transport mechanism.

4. The semiconductor manufacturing apparatus according to claim 1 and claim 3 comprising a plasma generation

mechanism for generating plasma in said processing chamber.

5. The semiconductor manufacturing apparatus according to claim 4, wherein said plasma generation mechanism radiates microwave thorough a slot antenna.

6. The semiconductor manufacturing apparatus according to claim 4, wherein a plurality of cylindrical permanent magnets are disposed substantially on the circumference surrounding the substrate in the atmosphere outside said vacuum vessel, in order to impress magnetic field around said substrate.

7. The semiconductor manufacturing apparatus according to any one of claims 1 to 6, wherein said substrate stage is provided with a means for impressing direct current or alternating current power.